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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,040	10/22/2003	Srikanth Nagaraja	1488.014US1	6426

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SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER

WILLIAMS, LAWRENCE B

ART UNIT PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/692,040

Applicant(s)

NAGARAJA, SRIKANTH

Examiner

Lawrence B. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23,25-27,30-33 and 38-41 is/are allowed.
- 6) ☒ Claim(s) 1,2,8-10,13-22,24,28,29,34,35 and 37 is/are rejected.
- 7) ☒ Claim(s) 3-7,11-12,34,36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

2. Claim 34 is objected to because of the following informalities:
 - a.) The examiners suggests the use of "receive" instead of receiving in line 3.
 - b.) The examiners suggests the use of "estimate" instead of estimating in line 5.
 - c.) The examiners suggests the use of "compute" instead of computing in line 7.
 - d.) The examiners suggests the use of "synchronize" instead of synchronizing in line 9.Appropriate correction is required.

3. Claim 36 is objected to because of the following informalities:
 - a.) The examiners suggests the use of "determine" instead of determining in line 4.
 - b.) The examiners suggests the use of "estimate" instead of estimating in line 5.
 - c.) The examiners suggests the use of "form" instead of forming in line 6.
 - d.) The examiners suggests the use of "estimate" instead of estimating in line 7.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 8 recites the limitation "obtaining an estimate of received signal phase" in line 3. The examiner assumes that applicant is making reference to the "input pilot signal" of claim 2. However, from the way the limitation is presented, it is not clear. The examiner suggests the applicant rewrite the limitation to particularly and distinctly claim the subject matter regarded as the invention.

Claim 9 is rejected based upon its dependency upon rejected claim 8.

6. Claim 13 recites the limitation "the received signal phase" in line 2. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 14 recites the limitation "the received signal phase" in line 2. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 15 recites the limitation "the transmitter" in line 2. There is insufficient antecedent basis for this limitation in the claim. Claim 15 recites the limitation "**the local receiver and the remote transmitter** clocks" in line 4. There is insufficient antecedent basis for the limitations in the claim.

Claims 16-22 are rejected as well based upon their dependency upon rejected claim 15.

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9. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 18 recites the limitation "obtaining an estimate of the received signal phase" in line 3. The examiner assumes that applicant is making reference to the "input pilot signal" of claim 16. However, from the way the limitation is presented, it is not clear. The examiner suggests the applicant rewrite the limitation to particularly and distinctly claim the subject matter regarded as the invention.

Claims 19, 22 are rejected based upon its dependency upon rejected claim 18.

10. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 20 recites the limitation "obtaining an estimate of the received signal phase" in line 2. The examiner assumes that applicant is making reference to the "input pilot signal" of claim 16. However, from the way the limitation is presented, it is not clear. The examiner suggests the applicant rewrite the limitation to particularly and distinctly claim the subject matter regarded as the invention.

Claim 21 rejected based upon its dependency upon rejected claim 18.

11. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 23 recites the limitation "wherein the clock correction module to synchronize the local receiver ADC and DAC clocks with the remote transmitter ADC and DAC

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clocks using the clock correction parameter". The limitation appears to be an incomplete sentence. The examiner suggests applicant rewrite the limitation to particularly point out and distinctly claim the subject matter mater regarded as the invention.

12. Claims 28, 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 28, 29 recite the limitation "the frequency offset" in lines 1 and 3. There is insufficient antecedent basis for these limitations in the claim.

13. Claim 35 recites the limitation "repeating the estimating, computing and synchronizing steps above for each **window length**" in line 4. There is insufficient antecedent basis for this limitation in the claim.

14. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 37 recites the limitation "obtaining an estimate of received signal phase". Even though the examiner assumes applicant is making reference to signal phase of the input pilot signal, it is not totally clear from the way the limitation is presented. The examiner suggests applicant rewrite the limitation to particularly point out and distinctly claim the subject matter mater regarded as the invention.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 1, 10, 15, 34, 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Alloin et al. (US Patent 6,804,318 B1).

(1) With regard to claim 1, Alloin et al. discloses in Fig(s). 3 and 6, a method for synchronizing a receiver clock with a transmitter clock in a communication system, during transmission of a data signal by a transmitter, comprising: obtaining estimates of frequency (col. 8, lines 24-28) and phase drifts (col. 7, lines 58-61) between the transmitter and receiver clocks; and synchronizing the receiver clock with the transmitter clock based on the estimated phase and frequency drifts (abstract; col. 9, line 66-col. 10, line 3).

(2) With regard to claim 10, Alloin et al also discloses in Fig(s). 3, 6, a method of synchronizing a local receiver clock with a remote transmitter clock in a multi-carrier transmission system (col. 8, line 55), comprising: obtaining estimates of frequency (col. 8, lines 24-28) and phase drifts (col. 7, lines 58-61) between the transmitter and receiver clocks; and synchronizing the local receiver clock with the remote transmitter clock based on the estimated frequency and phase drifts during transmission of a data signal by the remote transmitter (abstract; col. 9, line 66 – col. 10, line 3).

(3) With regard to claim 15, Alloin et al. also discloses in Fig(s). 3, 6, a method, comprising: obtaining estimates of frequency (col. 8, lines 24-28) and phase drifts (col. 7, lines

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58-61) between the transmitter and receiver clocks in a communication system; and synchronizing the local receiver and the remote transmitter clocks based on the estimated phase and frequency drifts (abstract; col. 9, line 66 - col. 10, line 3).

(4) With regard to claim 34, claim 34 restates the limitations of claim 2 on a computer readable medium. As noted above, Alloin et al. discloses the method as taught in claim 2. Alloin et al. also teaches that the clock synchronization method comprising computer-readable medium which stores computer-executable instructions, the instructions causing a computer to execute the method (col. 10, lines 4-23).

(5) With regard to claim 37, Alloin et al. also discloses in Fig. 4, estimating a reference phase (from feedback signal, 215); obtaining an estimate of received signal phase (50); and obtaining the phase drift by using the received signal phase and the estimated reference phase (col. col. 6, line 55-col. 7, line 11).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 2, 8-9, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alloin et al. (US Patent 6,804,318 B1) as applied to claims 1, 2 and 15, above.

(1) With regard to claim 2, Alloin et al. discloses the method of claim 1, wherein synchronizing the receiver and transmitter clocks further comprises: receiving an input pilot signal of a predetermined frequency and phase, by the receiver from the transmitter; estimating the frequency and phase drifts between the transmitter and the receiver clocks using the input pilot signal; computing a clock correction parameter (error correction signal, Fig. 2, 65) based on the phase (col. 7, lines 58-61) and frequency drifts (col. 8, lines 24-28); and synchronizing the receiver clock with the transmitter clock based on the clock correction parameter (col. 9, line 66-col. 10, line 3).

Though Alloin et al. does not teach an input pilot signal per se, he teaches in Fig(s). 3-5, receiving a network timing reference. It would be inherent to one skilled in the art that this network timing reference signal would be of a predetermined frequency and phase. This network timing reference signal serves the same purpose as applicant's pilot signal, i.e. a timing reference for phase and frequency synchronization of the receiver clock.

With regard to claim 8, Alloin et al. also discloses in Fig. 4, estimating a reference phase (from feedback signal, 215); obtaining an estimate of received signal phase (50); and obtaining the phase drift by using the received signal phase and the estimated reference phase (col. col. 6, line 55-col. 7, line 11).

(3) With regard to claim 9, Alloin et al. also discloses wherein synchronizing the receiver clock with the transmitter clock further comprises: synchronizing the receiver clock with the transmitter clock by correcting for the phase drift substantially after correcting for the frequency drift. Alloin et al. discloses estimating a phase error between the network clock and local clock (col. 7, lines 58-61) and estimating a frequency offset between the network clock and local clock

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(col. 8, lines 24-28) and correcting the local clock to the network clock (col. 9, line 66-col. 10, line 3). Alloin et al. also teaches that his sequence is example only and that the steps can be performed in sequence or substantially simultaneously.

(4) With regard to claim 16, claim 16 is noting more than restating the limitations of claim 2 and is similarly analyzed as claim 2 above.

Allowable Subject Matter

19. Claims 23, 25-27, 30-33, 38-41 are allowed.

20. Claims 24, 28-29 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

21. Claims 3-7, 11-12, 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. Claims 13-14, 17-22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

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23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Phogat et al. discloses in US 2006/0045174 A1 Method And Apparatus For Synchronizing A Transmitter Clock Of An Analog Modem To A Remote Clock.

b.) Awaya et al. discloses in US Patent 7,130,368 B1 Clock Recovery Using A Direct Smoothing Process.

c.) De Courville et al. discloses in US Patent 6,198,782 B1 Estimation OF Frequency Offsets In OFDM Communication Systems.

d.) Wu et al. discloses in US Patent 6,370,188 B1 Phase and Frequency Offset Compensation In A Telecommunications Receiver.

e.) Barman et al. discloses in US Patent 6,577,690 B1 Clock Recovery In Multi-Carrier Transmission Systems.

f.) Peeters et al. discloses in US 2004/0156441 A1 Method and Arrangement To Determine A Clock Timing Error In A Multi-Carrier Transmission System, And Related Synchronization Units.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghayour Mohammad can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

A handwritten signature in black ink, appearing to read 'Lawrence B. Williams', with a stylized flourish at the end.

March 1, 2007